SANDHILL STREAMHEAD SWAMP

Concept: The Sandhill Streamhead Swamp type covers very wet forests along mucky small streams in sandy terrain, which are dominated by combinations of *Nyssa biflora, Acer rubrum, Liriodendron tulipifera, Persea palustris,* and *Magnolia virginiana,* and have undergrowth of pocosin species. Either *Pinus taeda* or *Pinus serotina* may be present but are not dominant. These communities are conceptually intermediate between Cypress–Gum Swamp or Coastal Plain Small Stream Swamp, and Streamhead Pocosin, with the shrub and herb layers more related to the latter and the canopy more like the former.

Distinguishing Features: Sandhill Streamhead Swamps are distinguished from the closely associated Streamhead Pocosins by having canopy dominance by hardwoods, particularly including *Nyssa biflora*, rather than by *Pinus serotina*. The lower strata are often very similar.

Sandhill Streamhead Swamps are distinguished from Cypress–Gum Swamps by a more mixed canopy, which usually includes *Liriodendron tulipifera* and *Pinus serotina* as well as *Nyssa biflora*. *Taxodium ascendens* may be present in either but is rare in Sandhill Streamhead Swamp. Coastal Plain Small Stream Swamps have a mixed canopy that may contain many of they same species but usually contain additional species such as oaks. The well-developed shrub layer of Sandhill Streamhead Swamp, dominated by *Cyrilla racemiflora, Lyonia lucida, Ilex coriacea, Ilex glabra,* and other species shared with Streamhead Pocosin type, is quite different from the open and more mixed shrub layer of Coastal Plain Small Stream Swamp and the sparse, more flood-tolerant shrub layer of Cypress–Gum Swamp.

Nonriverine Swamp Forests also have a substantial component of pocosin species but differ floristically. They are easily distinguishable by occurring in flat areas that lack seepage or overland flooding.

Synonyms: *Nyssa biflora - Liriodendron tulipifera - Pinus (serotina, taeda) / Lyonia lucida - Ilex glabra* Forest (CEGL004734).
Ecological Systems: Atlantic Coastal Plain Blackwater Stream Floodplain Forest (CES203.247).

Sites: Sandhill Streamhead Swamps occur along small to medium drainages in the Sandhills region, where seepage sustains saturated conditions. Because of their distinctive regime of steady flow, floodplain development is limited and fluvial landforms are not present. The sites are flat or may extend slightly up the bordering slopes, but they have little microtopography.

Soils: Soils are mucky sands or loams. They are usually mapped as Johnston (Cumulic Humaquept).

Hydrology: The hydrologic regime of streams in the Sandhills is distinctive because the porous substrate leads to almost complete infiltration of rainfall and little surface runoff. Groundwater seepage maintains saturated conditions and supports steady stream flow. Overbank flooding is rare and sediment movement appears to be nonexistent away from the sandy channel itself.

Vegetation: Sandhill Streamhead Swamps may be closed or open forests. The canopy is a mix that includes *Nyssa biflora* in combination with *Liriodendron tulipifera, Acer rubrum* var. *trilobum*, *Pinus serotina, Pinus taeda, Persea palustris, Magnolia virginiana, Chamaecyparis thyoides*, and occasionally, *Liquidambar styraciflua* or *Taxodium ascendens*. The understory consists primarily of the same species but may also include *Ilex opaca* or *Oxydendrum arboreum*. The shrub layer is generally dense and is dominated by species shared with pocosins: *Cyrilla racemiflora, Lyonia lucida, Ilex coriacea, Ilex glabra,* and shrub-sized *Persea palustris* and *Magnolia virginiana*. Less abundant but fairly frequent shrubs include *Aronia arbutifolia, Morella caroliniana, Vaccinium formosum, Rhododendron viscosum*, and *Arundinaria tecta*. *Xanthorhiza simplicissima* often is present near the channel. *Smilax laurifolia* may form tangles, and *Smilax rotundifolia, Smilax glauca*, or less commonly *Muscadinia rotundifolia* may be present. The herb layer usually is sparse, though it may be locally denser in open areas. *Lorinseria areolata, Osmundastrum cinnamomeum, Osmunda spectabilis,* and *Sphagnum* spp. are the most constant and usually most abundant species. Other herbs may include *Juncus effusus, Chasmanthium laxum, Viola primulifolia Carex intumescens, Carex folliculata, Carex communis,* and other *Carex* spp.

Range and Abundance: Ranked G4?. Sandhills Streamhead Swamps are known only in the Sandhills region, though it is possible that similar conditions could exist locally elsewhere in the Coastal Plain. They are fairly abundant in the region in North Carolina. They also occur in South Carolina and possibly Georgia.

Associations and Patterns: Sandhill Streamhead Swamps are usually bordered by Pine/Scrub Oak Sandhill on adjacent upland slopes. Along drainages, Streamhead Pocosin usually occurs upstream. However, along a given drainage, Sandhill Streamhead Swamp, Streamhead Pocosin, Streamhead Atlantic White Cedar Forest, Streamhead Canebrake, and Coastal Plain Semipermanent Impoundment may occur in any order.

Variation: Examples vary in the amount of the various canopy trees, but it is unclear how much of this variation is natural and how much results from logging history or effects of fire exclusion.

Dynamics: The dynamics of Sandhill Streamhead Swamps appear to differ from most floodplain communities. Flooding is of marginal importance. Given the low nutrient status of soils and water, what flooding there is probably provides little nutrient subsidy. Because they occur along small streams that are closely bordered by longleaf pine communities, Sandhill Streamhead Swamps are frequently exposed to fire. The dense shrub layer makes them susceptible to burning, at least under some circumstances. Many examples show evidence of fire. Without a large component of pine with its flammable litter, they probably burn less intensely and less frequently than Streamhead Pocosins, but fire presumably is an important natural process in them.

The factors that lead to the occurrence of this community rather than others that may occur along Sandhills drainages are not entirely clear. Streamhead Pocosins probably occur where fire is more frequent, and Streamhead Canebrakes where it is most frequent. Streamhead Atlantic White Cedar Forests presumably need less frequent but occasional fire. It is possible these communities represent a shifting mosaic, where one may change into another over time. However, given that all may occur in the same present-day landscape with similar management regimes, such shifts must be uncommon. Given the limited mobility of *Arundinaria tecta* and *Chamaecyparis thyoides*, it

seems unlikely that communities dominated by them could shift around very frequently. However, the presence of *Arundinaria* in many Sandhill Streamhead Swamps may allow for rapid develop of canebrakes if fire frequency becomes high. It is also plausible that these different communities represent alternative stable states, where the flammability of the vegetation perpetuates a fire regime that allows it to persist after a rare establishing event. A further possibility is that unrecognized site differences affect the tendency to burn and lead to a stable mosaic of communities under natural conditions.

The dynamics of beaver ponds similarly are uncertain. If beavers create dams at random or systematically, their ponds and recovering vegetation may create a shifting mosaic under natural conditions. Alternatively, beavers may have had preferred pond sites while other streamhead areas never saw impoundment. It is possible that the Sandhill Streamhead Swamp community would establish itself more readily than other communities in drained beaver ponds, so that past impoundment is the key to present occurrence of this community.

Comments: Sandhill Streamhead Swamp is newly recognized with the Fourth Approximation. Occurrences of it were variously treated as Cypress–Gum Swamp (Blackwater Subtype) and Coastal Plain Small Stream Swamp (Blackwater Subtype) in the 3rd Approximation. They resemble the latter in the intermittent flooding regime, location along small streams, and common admixture of pines in the canopy. They resemble the former in usual dominance by *Nyssa biflora* and long hydroperiod. They are distinct from either in being closely related to Streamhead Pocosins, floristically and spatially. Almost all of the understory, shrub, vine, and herb layer plants are shared with Streamhead Pocosin communities; only the canopy differs.

Rare species: Vascular plants: *Eupatorium resinosum* and *Schoenoplectus etuberculatus.*
Vertebrate animals: *Hyla andersonii.*

References: